IN THE CLAIMS:

1. (Original) A stress measuring method characterized by comprising

an electron beam irradiating process that irradiates an electron beam on a specimen,

a spectroscopy process that analyses light generated from the specimen by the above-mentioned electron beam irradiating process and obtains a spectrum, and

a stress calculating process that obtains a stress change based on a spectrum shift between a spectrum obtained from the specimen in a predetermined state and a spectrum obtained from the specimen in a state different from the predetermined state.

2. (Original) The stress measuring method described in claim 1 and characterized by that a residual stress is obtained in the above-mentioned stress calculating process based on a spectrum shift between a specimen spectrum as being a spectrum in a state that no stress exists in the specimen and a stress impressed spectrum as being a spectrum in a state that a residual stress exists in the specimen.

3. (Currently Amended) The stress measuring method described in claim 1 ~~or 2~~, and characterized by that

an external force impressing process that applies an external force to the specimen prior to the above-mentioned electron beam irradiating process is further provided, and

an internal stress is obtained in the above-mentioned stress calculating process based on a spectrum shift between an internal stress impressed spectrum as being a spectrum in a state that an internal stress is generated in the specimen by the external force impressing process and a specimen spectrum as being a spectrum in a state no stress exists in the specimen or a

stress impressed spectrum as being a spectrum in a state that a residual stress exists in the specimen.

4. (Original) The stress measuring method described in either one of claim 1 through claim 3, and characterized by that

the above-mentioned electron beam irradiating process includes a broad area electron beam irradiating process that irradiates an electron beam without narrowing down on a broad area that is broad enough compared with a spot size of the electron beam that is narrowed down to obtain a requested space resolution, and

in the stress calculating process a spectrum obtained by analyzing light generated from the specimen by the broad area electron beam irradiating process is made to be a specimen spectrum as being a spectrum in a state that no stress exists in the specimen.

5. (Original) The stress measuring method described in either one of claim 1 through claim 3, and characterized by that

the above-mentioned electron beam irradiating process includes a broad area electron beam irradiating process that irradiates an electron beam on a broad area that is broad enough compared with a spot size of the electron beam that is narrowed down to obtain a requested space resolution with scanning the spot size, and

in the stress calculating process an average of spectra of light generated by irradiating each electron beam in the broad area electron beam irradiating process is made to be the specimen spectrum as being the spectrum in the state that no stress exists in the specimen.

6. (Currently Amended) The stress measuring method described in claim 4 ~~or claim 5,~~ wherein the above-mentioned broad area is ~~all~~ the entire area of the specimen.

7. (Currently Amended) The stress measuring method described in claim 4 ~~or claim 5,~~ wherein a diameter of the above-mentioned broad area is set as not less than 100 times of the spot size of the electron beam that is narrowed down so as to obtain the required space resolution.

8. (Currently Amended) The stress measuring method described in ~~either one of~~ claim 1 ~~through claim 3, and~~ characterized by that

a minute amount sample obtaining process that obtains a minute amount of a sample from the specimen is further included, and

in the stress calculating process a spectrum of light obtained by irradiating an electron beam on the minute amount sample is made to be a specimen spectrum as being a spectrum in a state that no stress exists in the specimen.

9. (Currently Amended) The stress measuring method described in ~~either one of~~ claim 1 ~~through claim 8, and~~ characterized by that

a composition analyzing process that analyzes a partial difference of composition of the specimen is further included, and

in the above-mentioned stress calculating process the above-mentioned specimen spectrum is determined for each area where composition of the specimen differs obtained by the above-mentioned composition analyzing process in consideration of a spectrum shift generated due to the difference of composition.

10. (Currently Amended) The stress measuring method described in ~~either one of~~ claim 1 ~~through claim 9~~, wherein

external light whose spectrum is known is irradiated in the above-mentioned electron beam irradiating process,

a spectrum of the external light and a spectrum of light emission from the specimen are obtained in the above-mentioned spectroscopy process, and

each position of spectra from the specimen in each state to be compared in order to measure a stress change is compensated based on the spectrum of the external light in the above-mentioned stress calculating process.

11. (Original) The stress measuring method described in claim 10, and characterized by that a position of a spectrum of a specimen spectrum as being the spectrum in the state that no stress exists in the specimen and a position of a spectrum of the stress impressed spectrum as being a spectrum in a state that a residual stress exists in the specimen are compensated respectively based on a spectrum of external light in the above-mentioned stress calculating process.

12. (Currently Amended) The stress measuring method described in claim 10 ~~or claim 11, and~~ characterized by that a position of a spectrum of an internal stress impressed spectrum as being a spectrum in a state that an internal stress exists in the specimen and a position of a spectrum of a specimen spectrum as being a spectrum in a state that no stress exists in the specimen or a position of a spectrum of the stress impressed spectrum as being a spectrum in a state that a residual stress exists in the specimen are compensated respectively based on a spectrum of external light in the above-mentioned stress calculating process.

13. (Currently Amended) The stress measuring method described in claim 10 ~~or claim 11~~, wherein a predetermined peak wavelength as being a reference for the above-mentioned external light spectrum is set near a predetermined peak wavelength for the light emission spectrum from the specimen.

14. (Currently Amended) The stress measuring method described in ~~either one of~~ claim 1 ~~through claim 13, and~~ characterized by that a correlation calculating process that calculates a correlation between an amount of external force impressed on the specimen and an amount of the above-mentioned spectrum shift is included prior to the above-mentioned stress calculating process.

15. (Currently Amended) The stress measuring method described in ~~either one of~~ claim 1 ~~through claim 14, and~~ characterized by that the above-mentioned specimen includes at least one kind of an element selected from a family consisting of lanthanoid by an amount within a range of 1 ppm ~ 10000 ppm.

16. (Original) The stress measuring method described in claim 15, and characterized by that the above-mentioned lanthanoid is at least one element selected from a family consisting of Sm, Eu, Tb, ~~Y,~~ Yb, La, Er, and Gd.

17. (Currently Amended) A stress measuring device characterized by comprising

an electron beam irradiating ~~means~~ unit that irradiates an electron beam on a specimen,

a spectroscopy ~~means~~ unit that analyzes light generated from the specimen by the electron beam irradiating ~~means~~ unit so as to obtain a spectrum, and

a stress calculating ~~means~~ unit that obtains a stress change generated in the specimen based on a spectrum shift between a spectrum obtained from the specimen in a predetermined state and a spectrum obtained from the specimen in a state different from the predetermined state.

18. (Currently Amended) The stress measuring device described in claim 17, and characterized by the above-mentioned stress calculating ~~means~~ unit is to obtain a residual stress based on a spectrum shift between a specimen spectrum as being a spectrum in a state that no stress exists in the specimen and a stress impressed spectrum as being a spectrum in a state that a residual stress exists in the specimen.

19. (Currently Amended) The stress measuring device described in claim 17 ~~or claim 18, and~~ characterized by that an external force impressing ~~means~~ unit that applies an external force to the specimen is further provided.

20. (Currently Amended) The stress measuring device described in claim 19, and characterized by that the above-mentioned stress calculating ~~means~~ unit is to obtain an internal stress from a spectrum shift between an internal stress impressed spectrum in a state that the internal stress is generated in the specimen by the external stress impressing ~~means~~ unit and the above-mentioned specimen spectrum or the above-mentioned stress impressed spectrum.

21. (Currently Amended) The stress measuring device described in ~~either one of~~ claim 17 ~~through claim 20, and~~ characterized by that a minute amount sample obtaining ~~means~~ unit that obtains a minute amount of sample from the spectrum is further provided.

22. (Currently Amended) The stress measuring device described in ~~either one of~~ claim 17 ~~through claim 21, and~~ characterized by that a composition analyzing ~~means~~ unit that analyses a partial difference of composition of the specimen is further provided.

23. (Currently Amended) The stress measuring device described in ~~either one of~~ claim 17 ~~through claim 22, and~~ characterized by that an external light irradiating ~~means~~ unit that irradiates external light whose spectrum is known is further provided.

24. (Currently Amended) The stress measuring device described in ~~either one of~~ claim 17 ~~through claim 23, and~~ characterized by that a visualizing ~~means~~ unit that visualizes a portion to be measured of the above-mentioned specimen is further provided.

25. (Currently Amended) The stress measuring device described in ~~either one of~~ claim 17 ~~through claim 24, and~~ characterized by that a diameter of a beam spot of an electron beam irradiated by the above-mentioned electron beam irradiating ~~means~~ unit is not more than 100 nm.

26. (Currently Amended) The stress measuring device described in ~~either one of~~ claim 17 ~~through claim 25, and~~ characterized by that the above-mentioned electron beam irradiating ~~means~~ unit is a scanning electron microscope.

27. (Currently Amended) A stress measuring device characterized by comprising

a light irradiating process unit that irradiates irradiating light on a specimen,

a spectroscopy process unit that analyzes light generated from the spectrum by the above-mentioned light irradiating process so as to obtain a spectrum, and

a stress calculating process unit that obtains a stress change generated in the specimen based on a spectrum shift between a spectrum obtained from the specimen in a predetermined state and a spectrum obtained from the specimen in a state different from the predetermined state, wherein

the light irradiating process unit includes a broad area light irradiating process that irradiates irradiating light without narrowing down the irradiating light on a broad area that is broad enough compared with a spot size of the irradiating light that is narrowed down to obtain a requested space resolution, and

in the above-mentioned stress calculating process unit a spectrum obtained by analyzing light generated from the specimen by the broad area light irradiating process is made to be a specimen spectrum as being a spectrum in a state that no stress exists in the specimen.

28. (Currently Amended) The stress measuring device characterized by comprising

a light irradiating process unit that irradiates irradiating light on a specimen,

a spectroscopy process unit that analyzes light generated from the spectrum by the above-mentioned light irradiating process unit so as to obtain a spectrum, and

a stress calculating process unit that obtains a stress change generated in the specimen based on a spectrum shift between a spectrum obtained from the specimen in a predetermined state and a spectrum obtained from the specimen in a state different from the predetermined state, wherein

the above-mentioned light irradiating process unit includes a broad area light irradiating process that irradiates irradiating light on a broad area that is broad enough compared

with a spot size of the irradiating light that is narrowed down to obtain a requested space resolution with scanning the spot size, and

in the above-mentioned stress calculating process unit an average of spectra of light generated by irradiating each irradiating light in the broad area light irradiating process is made to be a specimen spectrum as being a spectrum in a state that no stress exists in the specimen.

29. (New) A method of measuring stress comprising:

providing a specimen to be measured;

irradiating the specimen with an electron beam;

measuring the radiation from the specimen after contact with the electron beams; and

calculating the stress based upon a spectrum shift between a first spectrum of a predetermined reference state and a second spectrum measured at a predetermined measurement position on the specimen.

30. (New) The method of Claim 29 wherein the first spectrum of the predetermined reference state is determined by averaging a plurality of measurements across the specimen to approximate a stress-free state for the specimen.

31. (New) The method of Claim 30 wherein the plurality of measurements represents an area of the specimen which is approximately 100 times as large or larger than the predetermined measurement position.

32. (New) The method of Claim 29 wherein the predetermined reference state is determined by measuring the first spectrum while exerting a stress force on the specimen of a predetermined value and the second spectrum at the predetermined measurement position is measured without exerting the stress force.

33. (New) The method of Claim 32 wherein the stress force is applied mechanically to the specimen.

34. (New) The method of Claim 32 wherein the stress force is applied thermally to the specimen.

35. (New) The method of Claim 32 wherein the predetermined reference state is measured over a plurality of different stress forces to correlate the amount of external force and the corresponding spectrum shift.

36. (New) The method of Claim 29 further including preparing the specimen to be measured by including within the specimen a predetermined material that can be activated by the electron beam to emitting radiation.

37. (New) The method of Claim 35 wherein the predetermined material includes at least one element from a lanthanoid series of elements.

38. (New) The method of Claim 36 wherein the ratio of the lanthanoid to the specimen is within a range of 1 ppm to approximately 10000 ppm.

39. (New) The method of Claim 29 further including determining the composition of the specimen and adjusting the calculate stress on the basis of the determined composition relative to a predetermined composition standard for the specimen.

40. (New) The method of Claim 29 further including controlling the temperature of the specimen during the measurement steps to a predetermined temperature.

41. (New) The method of Claim 29 further including irradiating the specimen with a predetermined light radiation and measuring the radiation from the specimen after contact with the light radiation to provide a peak reference for compensation of the electron beam calculated stress.

42. (New) The method of Claim 29 wherein the predetermined measurement position is irradiated by an electron beam having a diameter of 10 nm or less.

43. (New) The method of Claim 29 further including measuring the residual stress in the specimen by measuring at least a portion of the specimen in a state without any residual stress and calculating peak shifts of the first and second spectrums.

44. (New) A system for measuring stress in a specimen with an electron beam comprising:

a irradiating unit for providing an electron beam to irradiate the specimen;

a measuring unit for providing measurement signals of the radiation from the specimen after contact with the electron beams; and

a calculating unit for calculating the stress from the measurement signals by determining a spectrum shift between a first spectrum of a predetermined reference state and a second spectrum measured at a predetermined measurement position on the specimen.

45. (New) The system of Claim 44 wherein the first spectrum of the predetermined reference state is determined by the calculating unit by averaging a plurality of measurements across the specimen to approximate a stress-free state for the specimen.

46. (New) The system of Claim 45 wherein the irradiating unit directs the electron beam to enable a plurality of measurements representative of an area of the specimen which is approximately 100 times as large or larger than the predetermined measurement position.

47. (New) The system of Claim 44 further including a stress force applying unit wherein the predetermined reference state is determined by measuring the first spectrum while exerting a stress force on the specimen of a predetermined value and the second spectrum at the predetermined measurement position is measured without exerting the stress force.

48. (New) The system of Claim 47 wherein the stress force is applied mechanically to the specimen.

49. (New) The system of Claim 47 wherein the stress force is applied thermally to the specimen.

50. (New) The system of Claim 47 wherein the predetermined reference state is measured over a plurality of different stress forces to correlate the amount of external force and the corresponding spectrum shift.

51. (New) The system of Claim 44 further including a doping unit for preparing the specimen to be measured by including within the specimen a predetermined material that can be activated by the electron beam to emitting radiation.

52. (New) The system of Claim 51 wherein the predetermined material includes at least one element from a lanthanoid series of elements.

53. (New) The system of Claim 52 wherein the ratio of the lanthanoid element to the specimen is within a range of 1 ppm to approximately 10000 ppm.

54. (New) The system of Claim 44 further including a composition analyzing unit for determining the composition of the specimen and adjusting the calculate stress on the basis of the determined composition relative to a predetermined composition standard for the specimen.

55. (New) The system of Claim 44 further including a temperature control unit for controlling the temperature of the specimen during the measurement to a predetermined temperature.

56. (New) The system of Claim 44 further including a light radiating unit for illuminating the specimen with light and a light measuring unit for measuring radiation from the specimen after contact with the light radiation to provide a peak reference for compensation of the electron beam calculated stress.

57. (New) The system of Claim 44 wherein the predetermined measurement position is irradiated by an electron beam having a diameter of 10 nm or less from the irradiating unit.